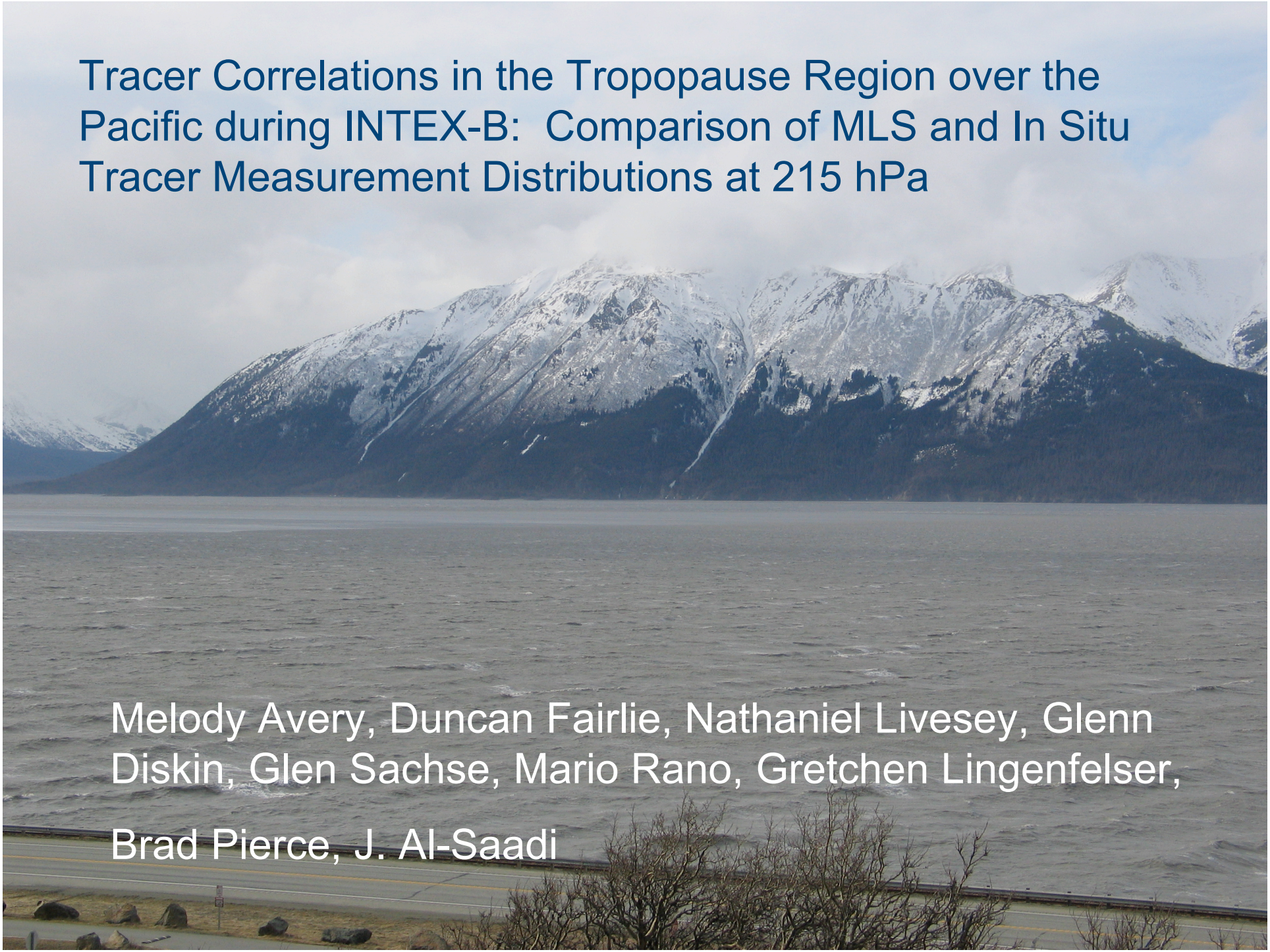
Tracer Correlations in the Tropopause Region over the Pacific during INTEX-B: Comparison of MLS and In Situ Tracer Measurement Distributions at 215 hPa



Melody Avery, Duncan Fairlie, Nathaniel Livesey, Glenn Diskin, Glen Sachse, Mario Rano, Gretchen Lingenfelser,

Brad Pierce, J. Al-Saadi

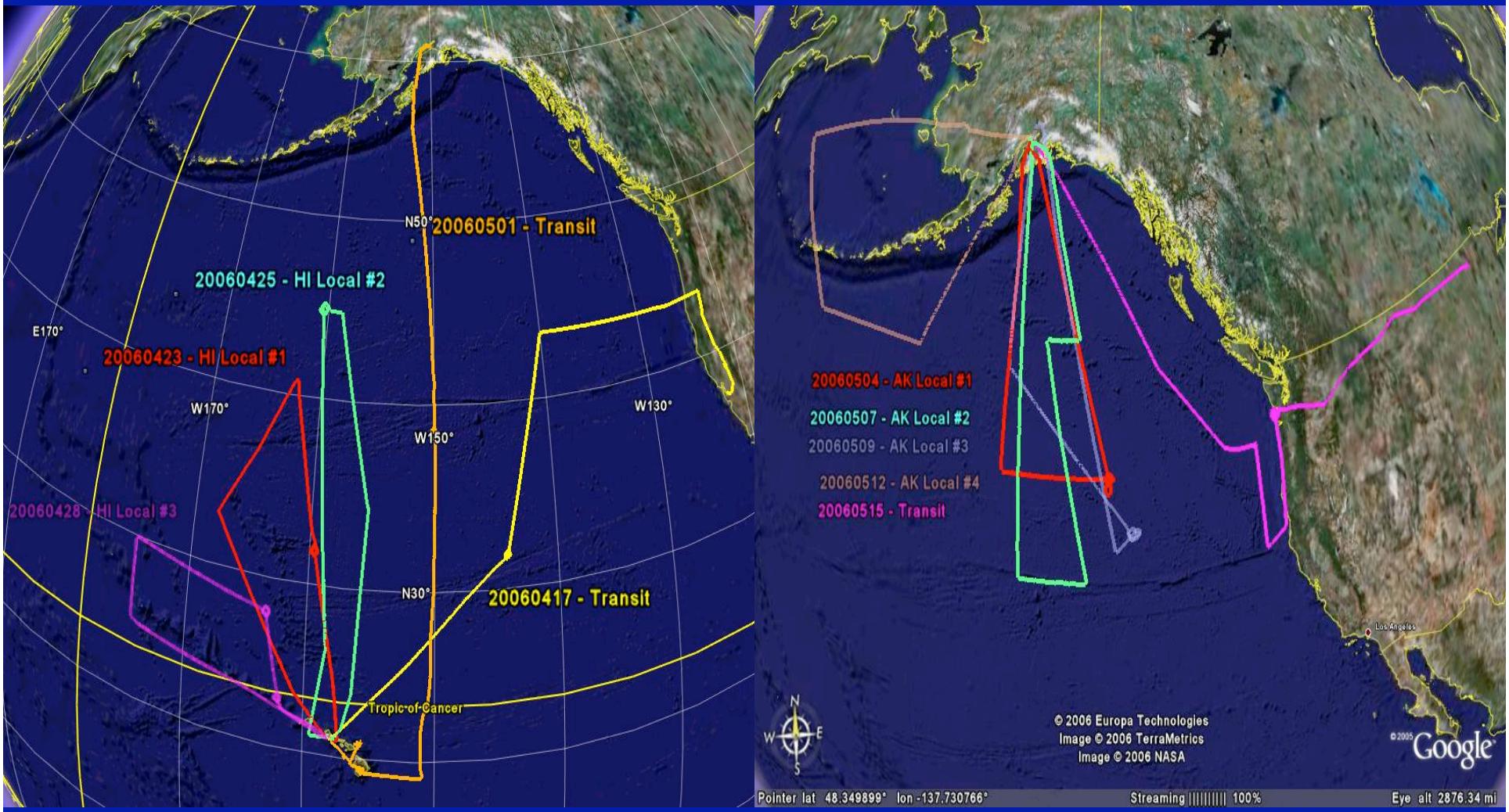
Research Objectives:

- Study the complex tropopause transition region.
- Simple non-coincident data comparison
  - Look at a very simple system - O3:CO
  - Simple non-coincident data comparison

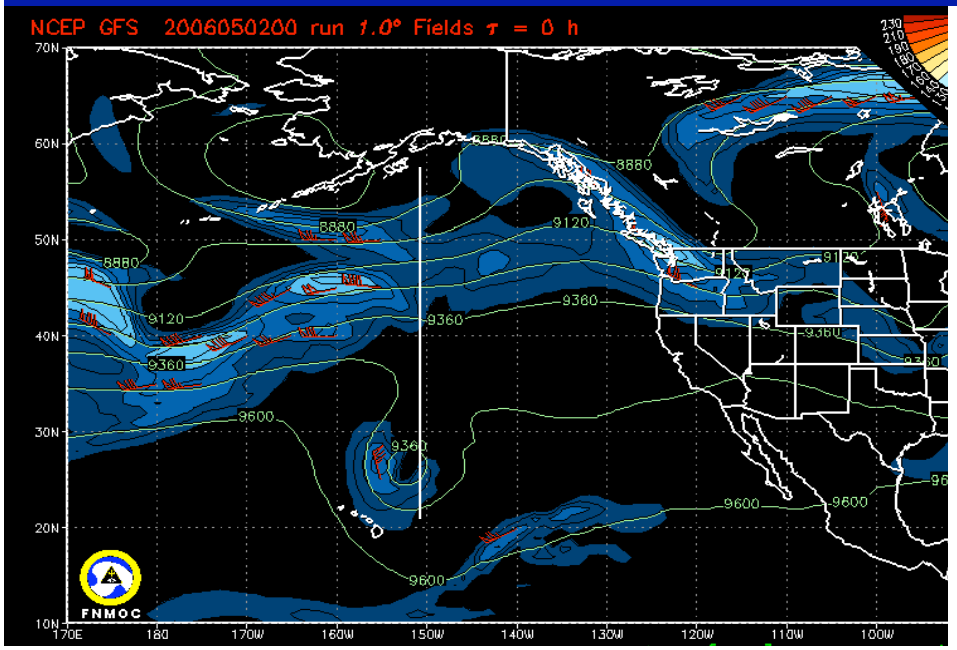
Spatial match: look for dynamically coherent geophysical regions

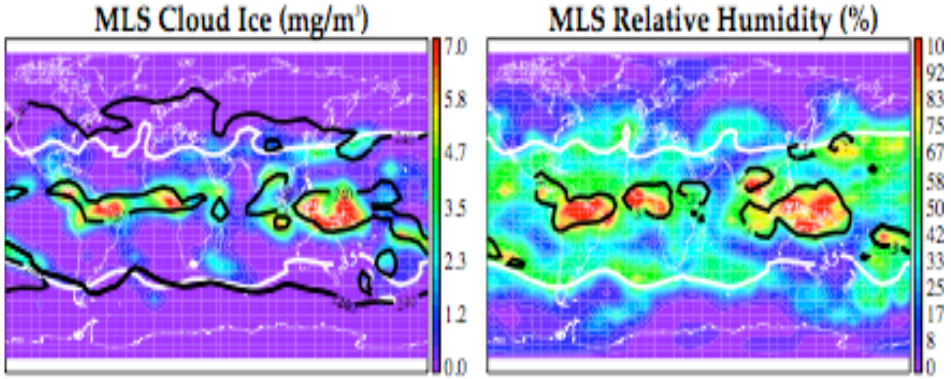
Temporal match: seasonal or monthly

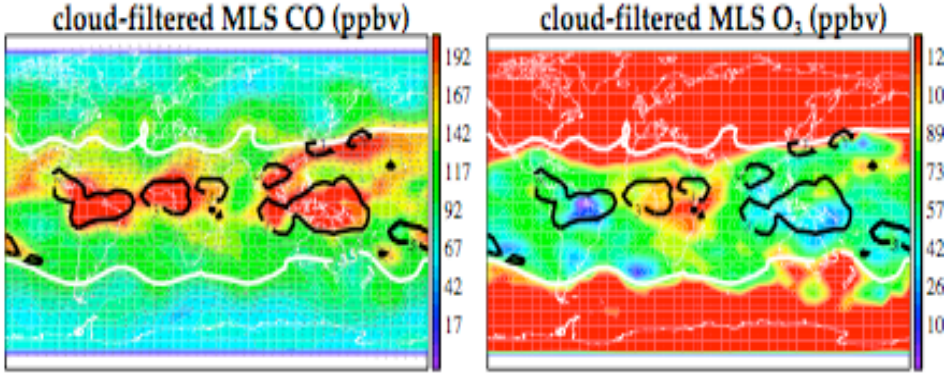
INTEX-B Pacific DC-8 Flight Tracks

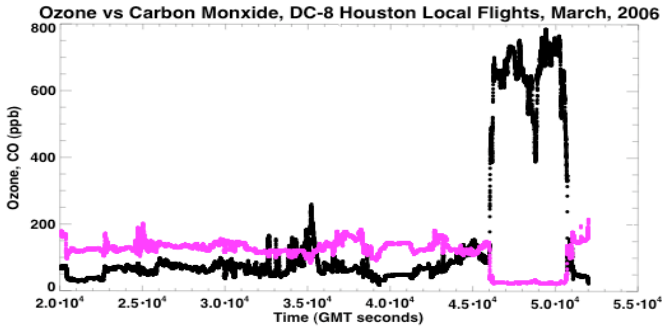


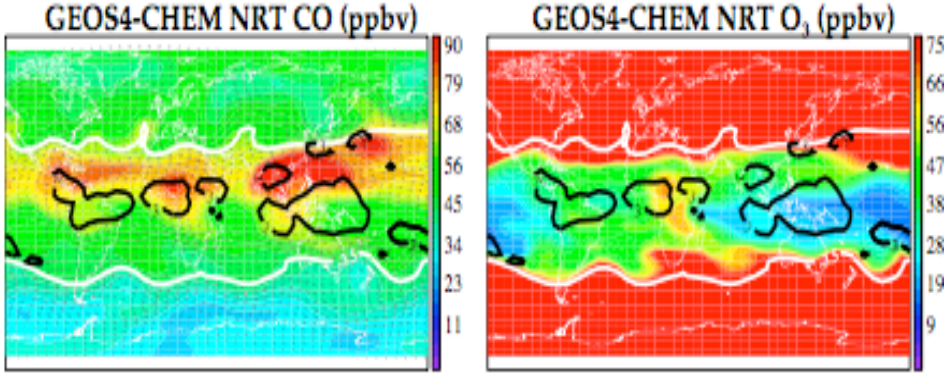
May 1 Case Study: In Situ Data -vs- MLS Global Weekly UT/LS



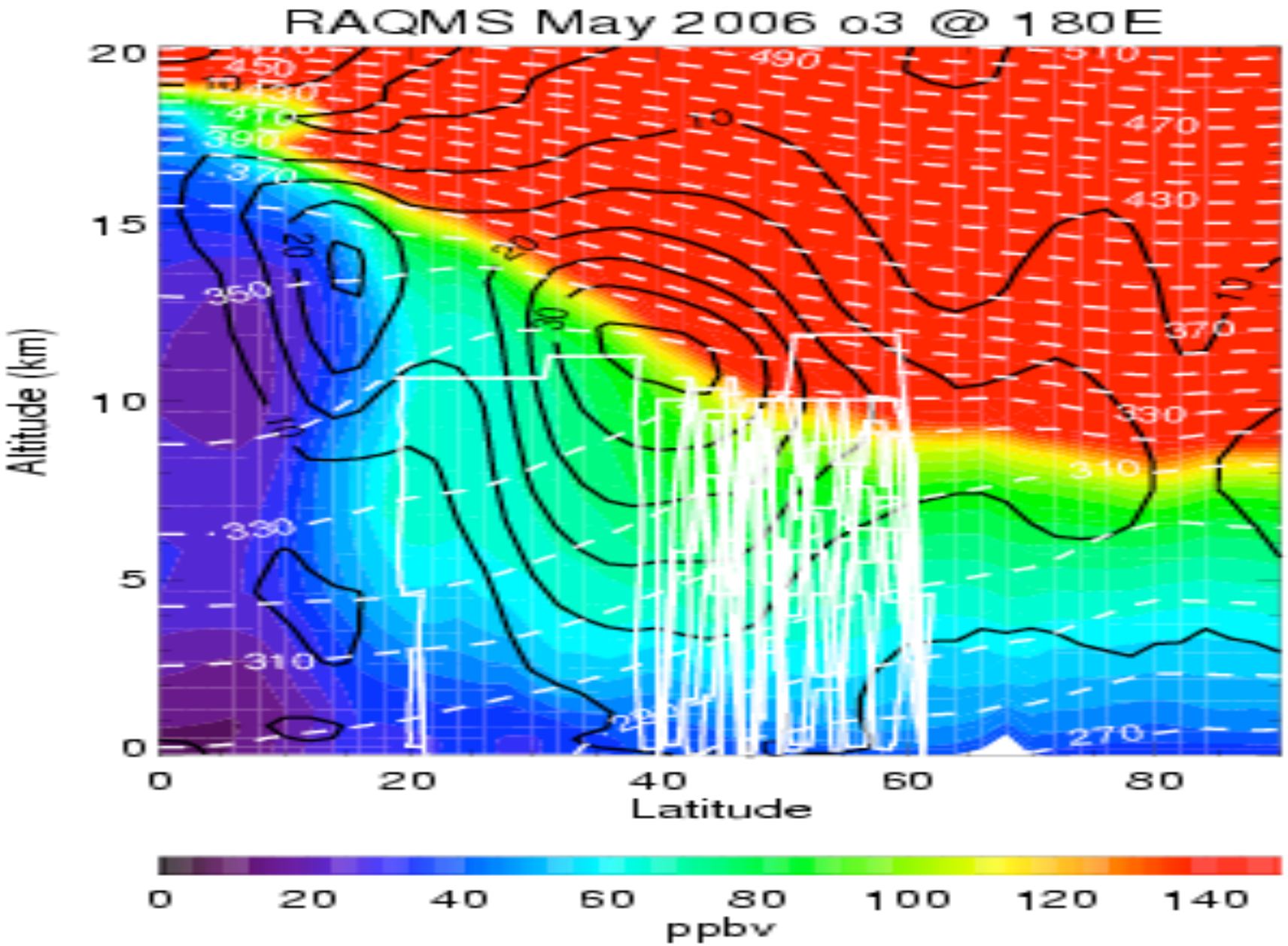






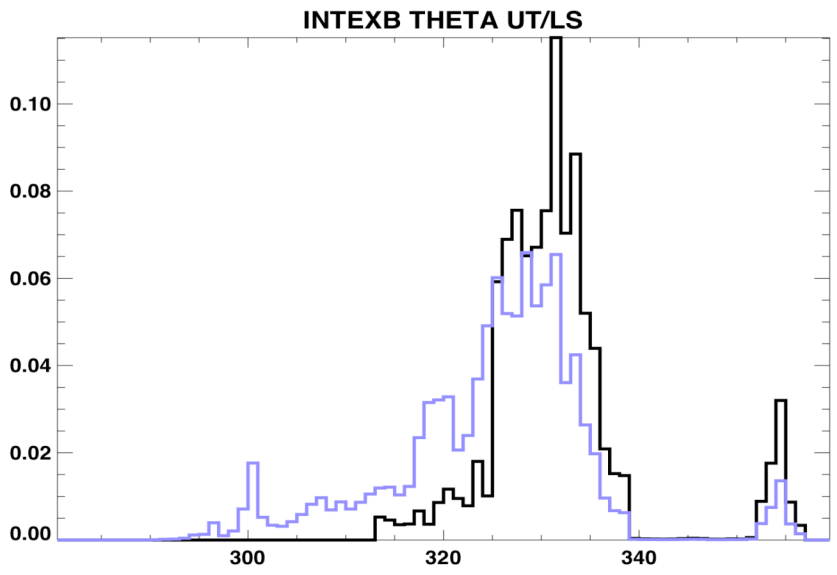


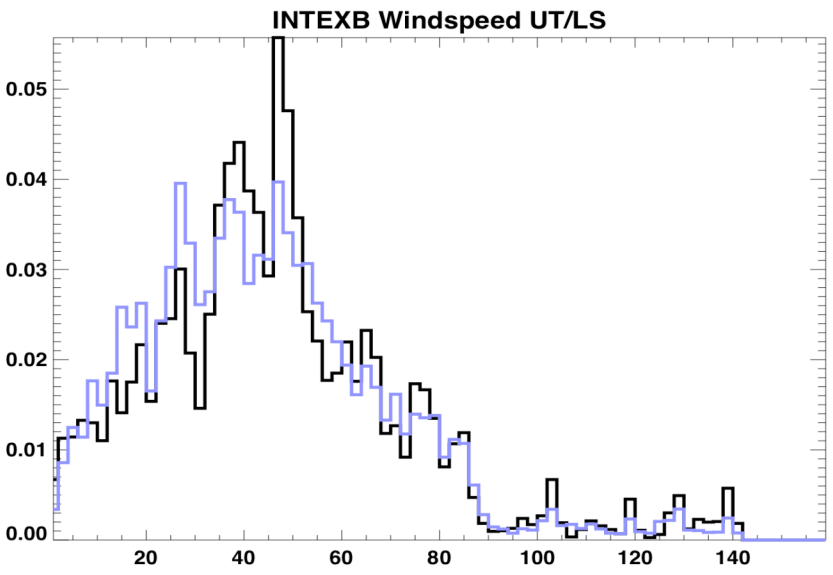
May 2006 Pacific X-Section (180E)

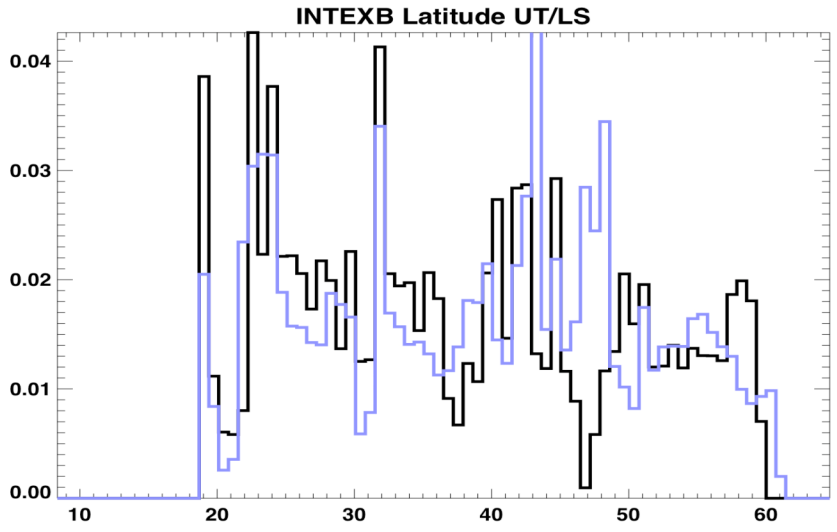


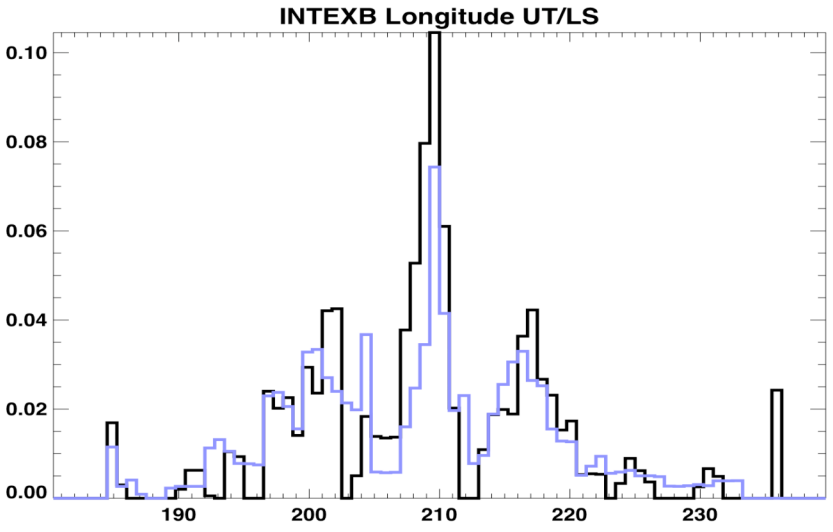
DC8 Flight Tracks shown in white

DC-8 In Situ 1-s sampling - MLS 215 (black), p < 500 hPa (blue)

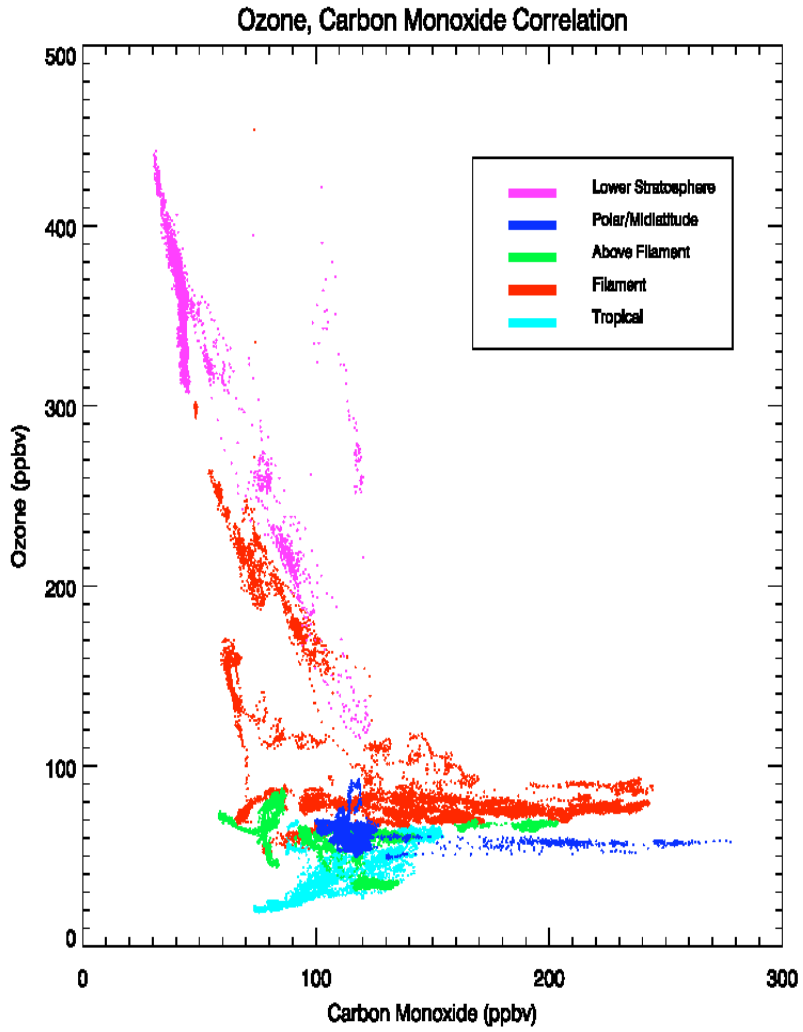


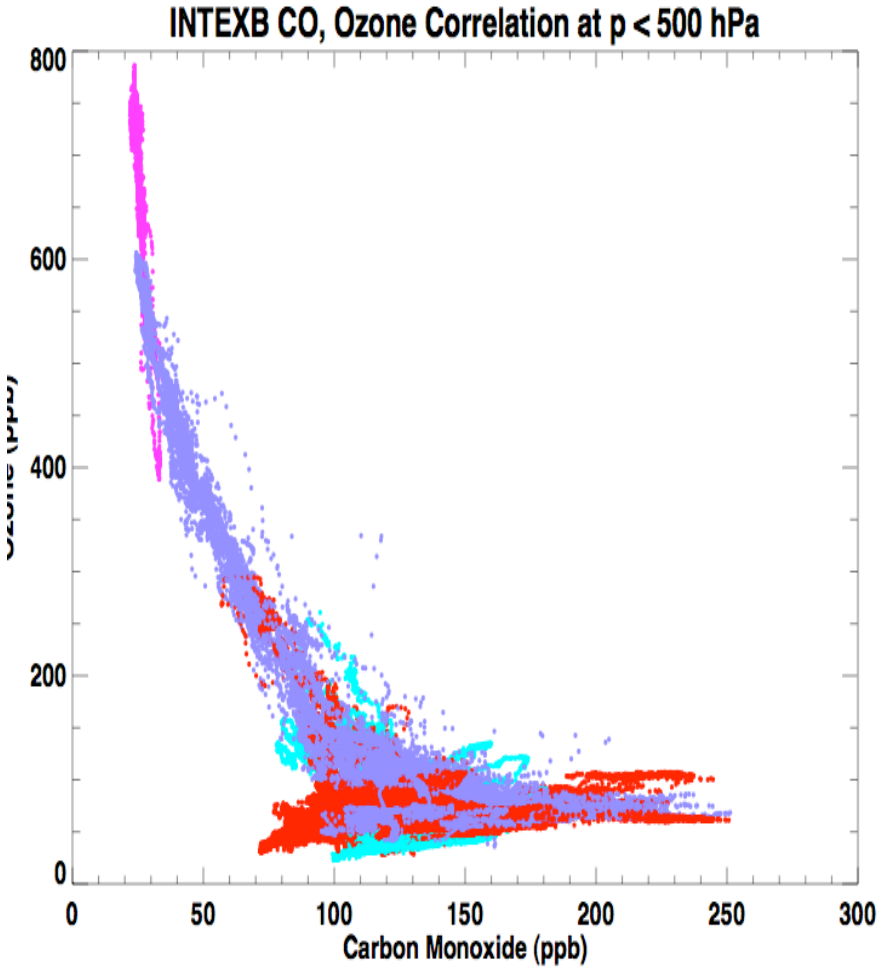






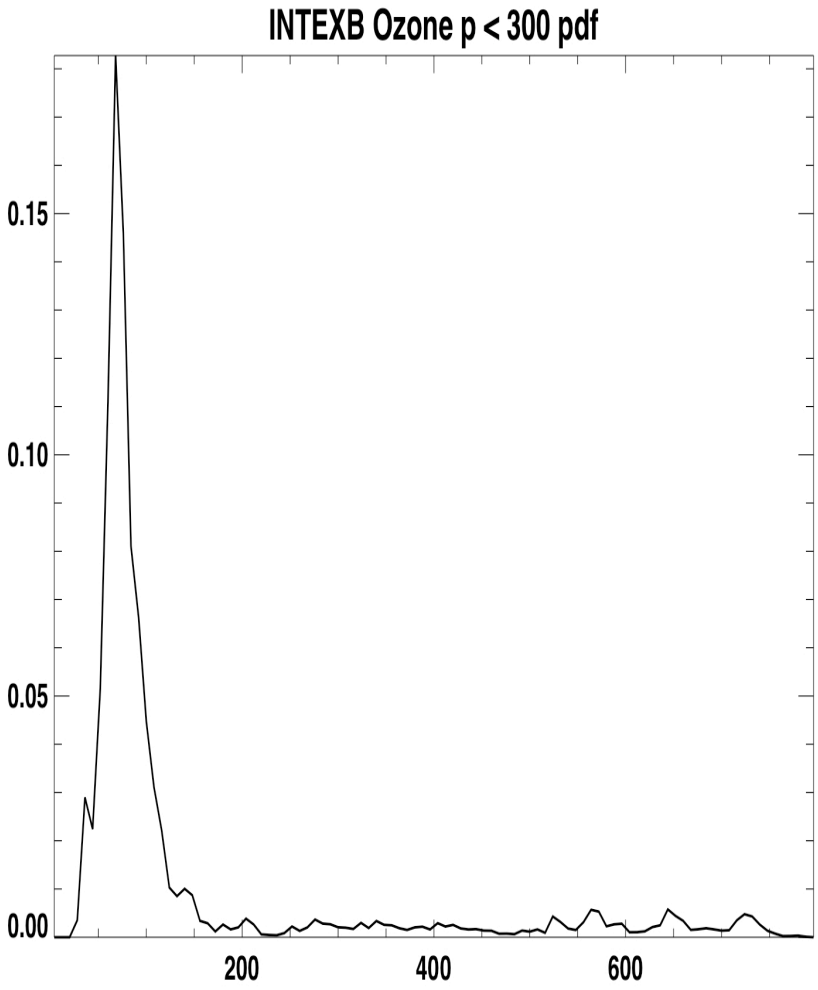
O3:CO: Comparison of Pacific Springtime Upper Tropospheric Composition Measured during TRACE-P, INTEXB

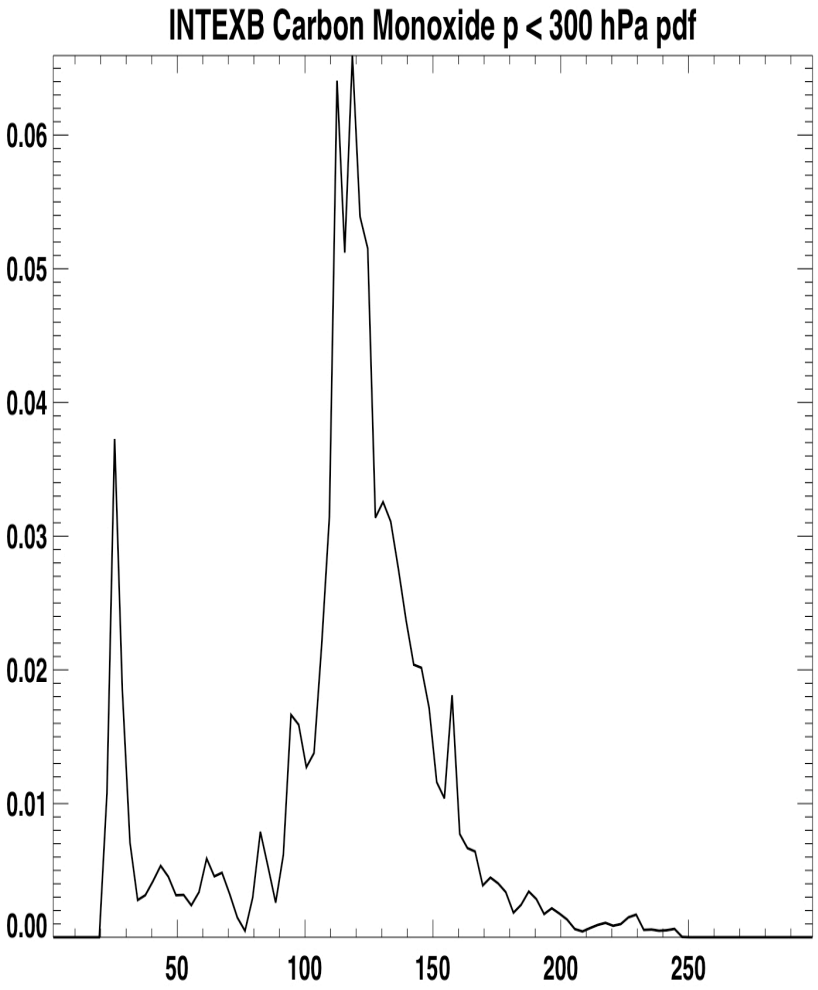




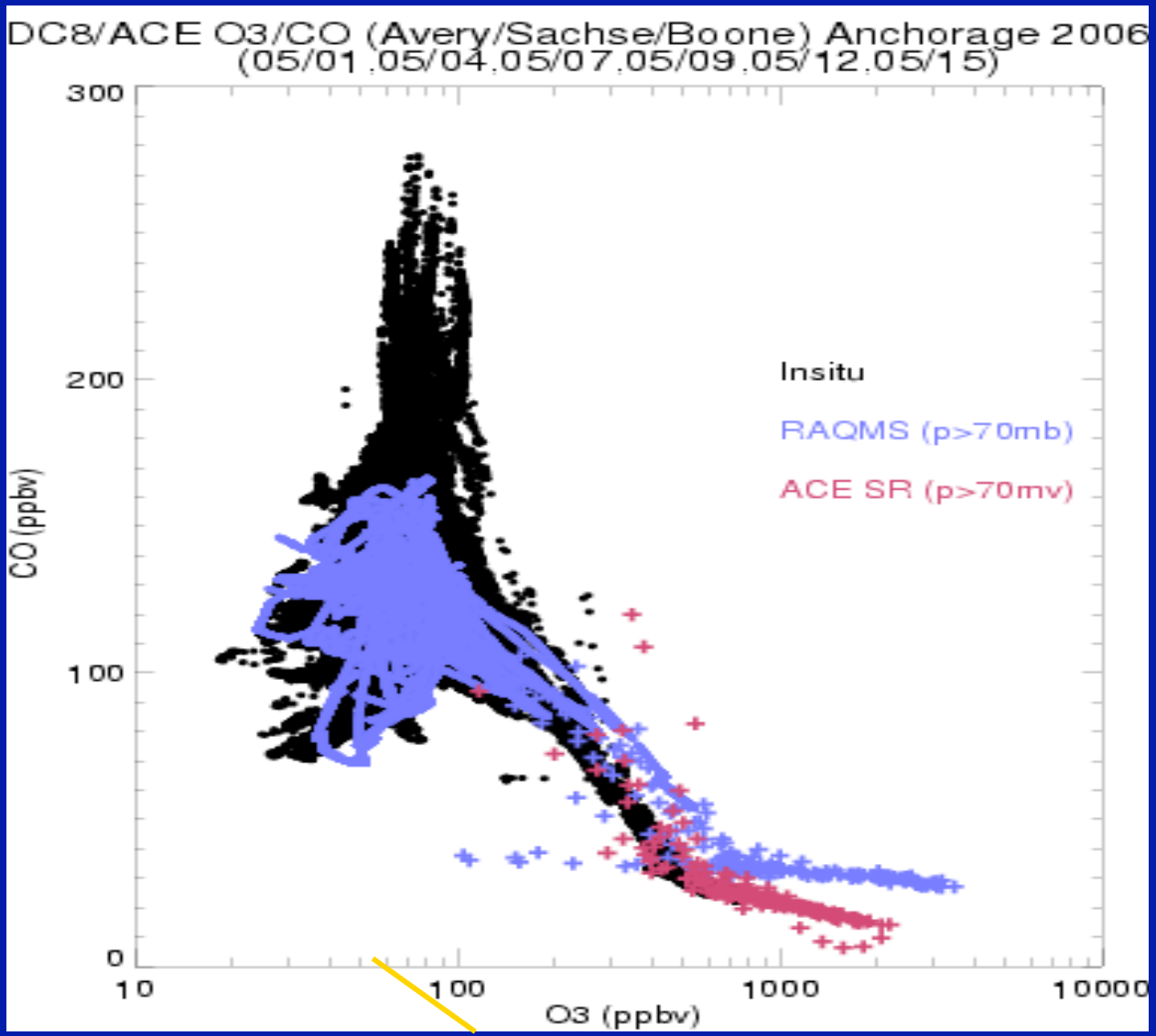
TRACE-P (March, April 2001) INTEX-B (April, May 2006)

DC-8 In Situ Data Distributions: Ozone and CO



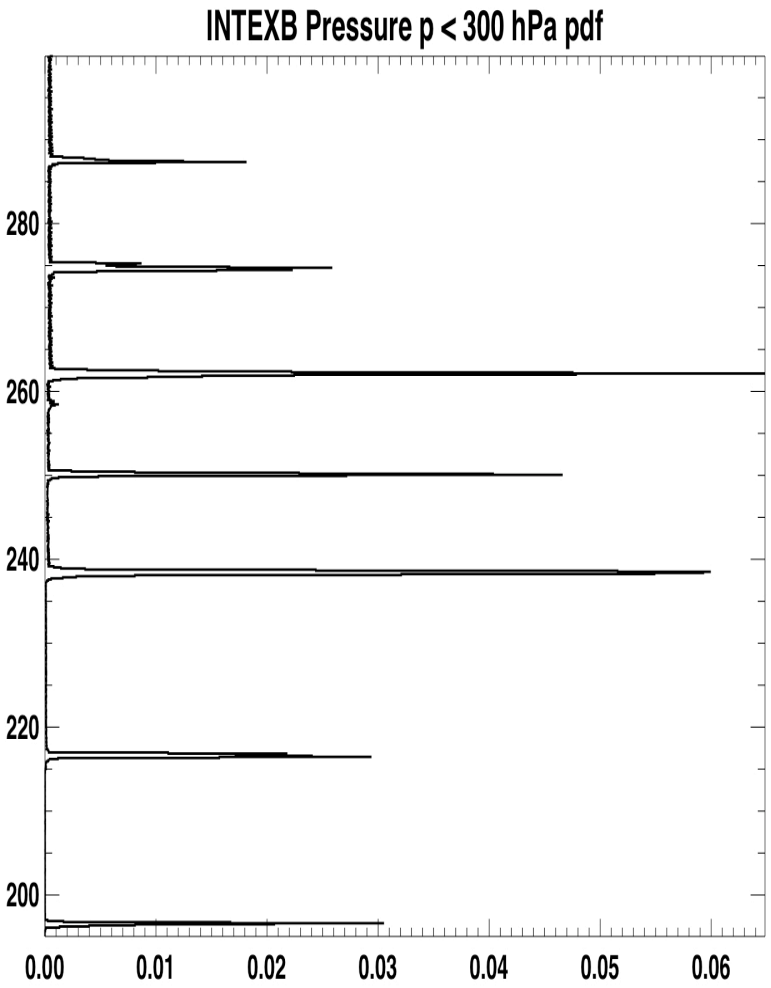


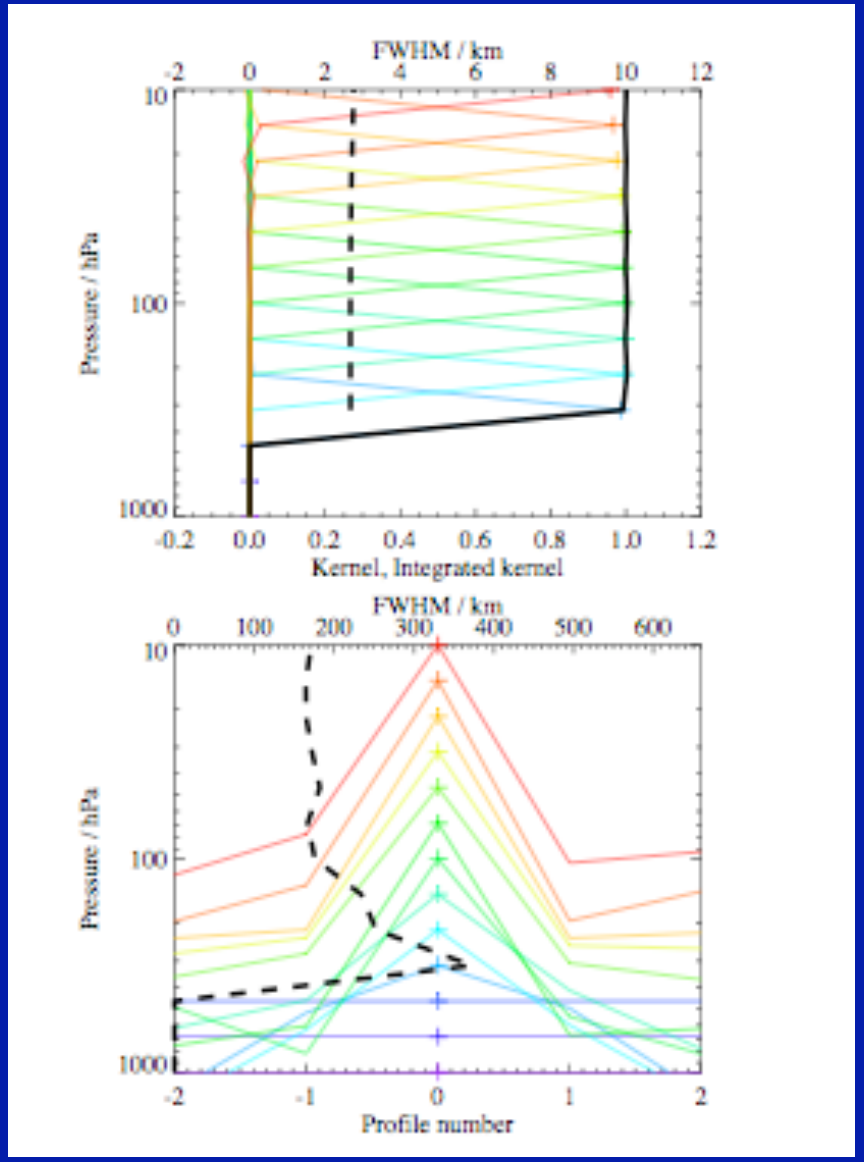
May 2006 Pacific RAQMS/DC8/ACE O3/CO Correlations



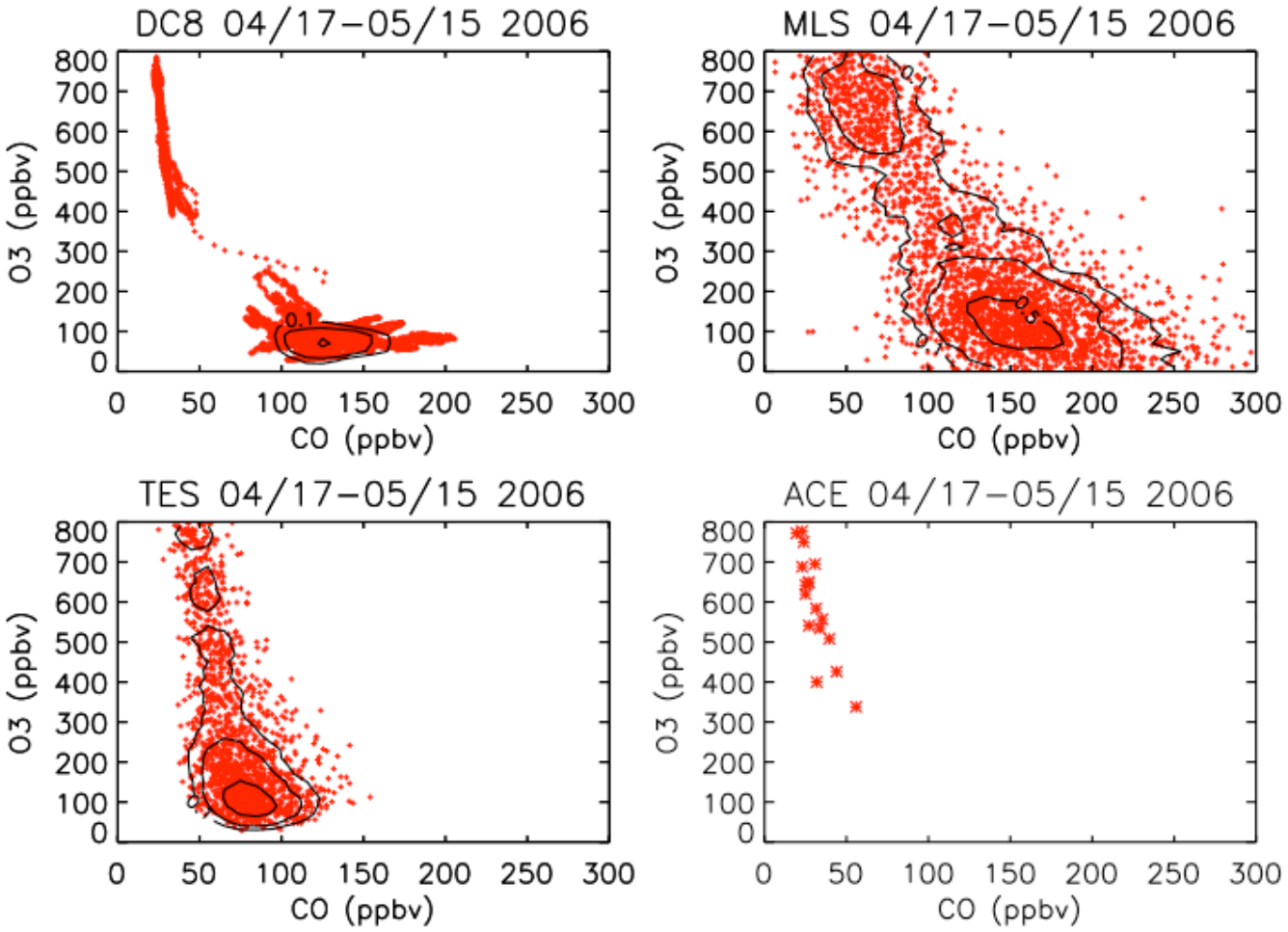
Plot by Brad Pierce, RAQMS modeling by B. Pierce, J. Al-Saadi, C.Kittaka, D. Fairlie…

MLS -vs- DC-8 Sampling at “215 hPa”



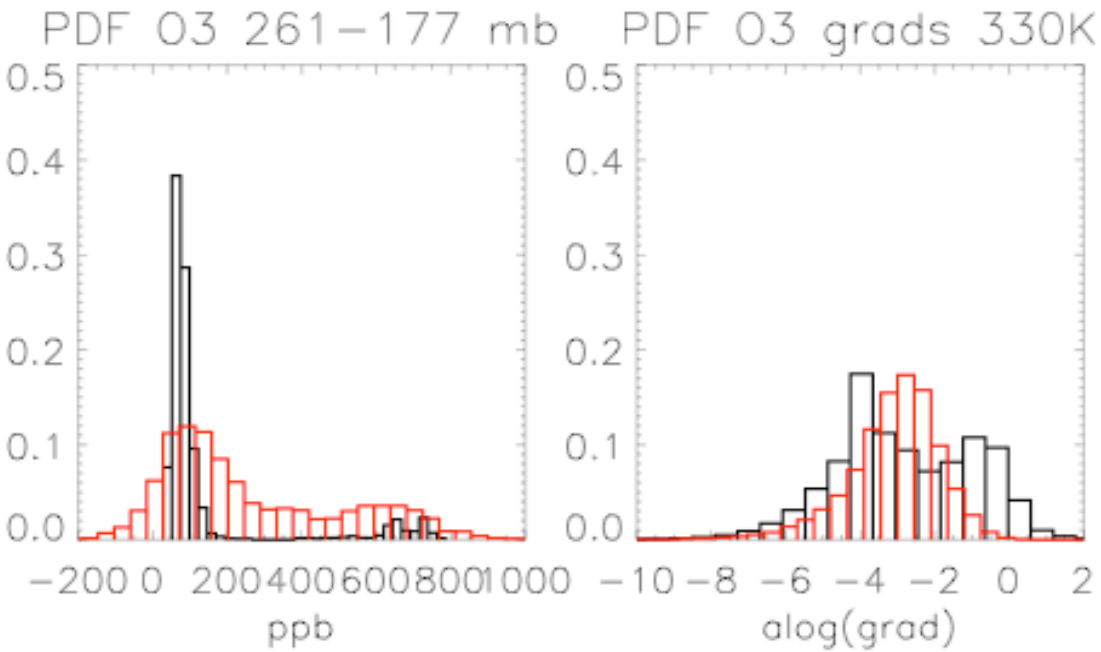


Comparison of O3:CO at MLS “215 hPa”



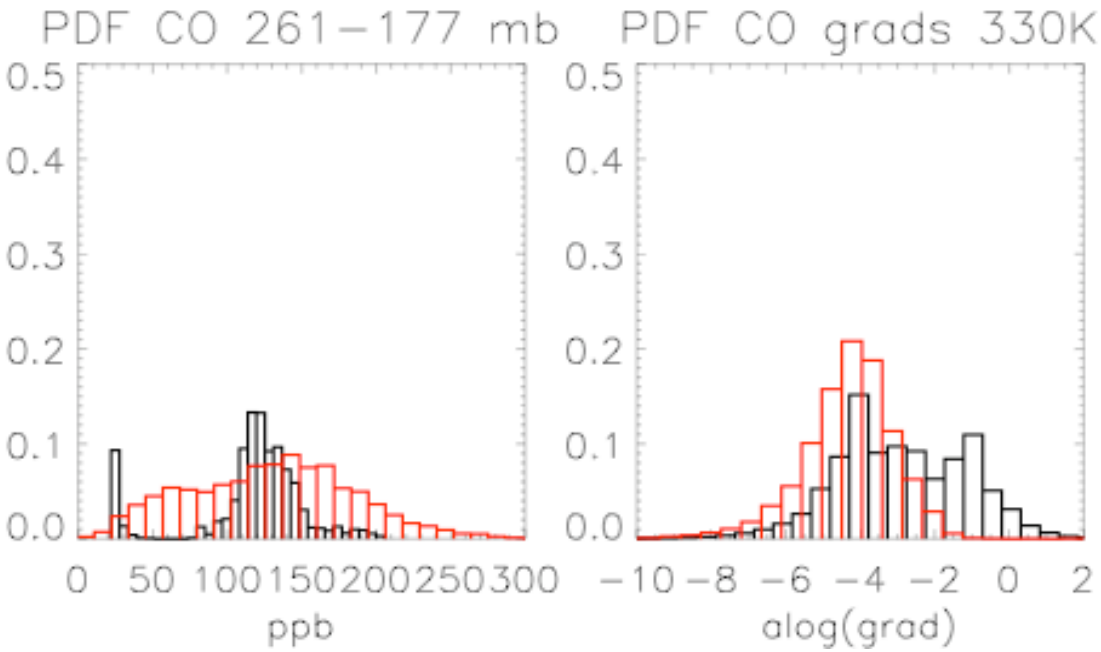
MLS V 1.5 215 hPa (red), FASTOZ/DACOM in situ data (black)

Ozone



Ozone gradients

CO



CO gradients

Strategic Plan/Research Roadmap:

Goals: Characterize scaling of UT/LS mixing and exchange processes.

Characterize seasonal and temporal variability of the near-tropopause region.

Methods: Combine last 10 years of aircraft campaign data, in situ, remote (lidar), sondes.

Add more data from space - esp. TES and AIRS (temperature, water vapor, ozone and carbon monoxide)

Geophysical coordinates:

Vertical: Theta

Horizontal: Find an “Equivalent Latitude”

Temporally: Match averaging time to process scale length.

dailypress.com/news/hr-dpboatonrocks20071001105008,0,4862092.photo

dailypress.com

Boat on the rocks

September 30, 2007

This boat got stuck on the rocks Saturday evening. Hampton Division of Fire & Rescue boats rescued the six people and one dog. The rocks mark where a lighthouse once stood just off the Grandview Nature Preserve in Hampton.